ALARA TRAINING

Workplace: 509 CS, Base Information Transit Center (BITC)
WIC: 0203-ADMI-190A

Ionizing Radiation Source/Emitter: Innervu Cabinet X- Ray Inspection System, being prepared to be used for bomb inspection in the official mail system.

1. **Risk from radiation exposure.** (See Attach 1) Personnel operating the x-ray inspection system units have a potential risk of exposure to ionizing radiation. Some of the health effects that exposure to radiation may cause are cancer (including leukemia), birth defects in the future children of exposed parents, and cataracts. There are three types of effects, which could be encountered:

a. **Acute effects**. Are observable shortly after receiving a very large dose in a short period of time.

b. **Chronic effects**. Cancer may occur years after exposure to a high dose or radiation or as a result of years of exposure to lesser doses.

c. **Genetic effects**. Can occur when there is radiation damage to the genetic material.

The main concern that Air Force personnel who are occupationally exposed to radiation should have is for the chronic incidence of cancer. The chance of delayed cancer is believed to depend on how much radiation exposure a person gets; therefore, every reasonable effort should be made to keep exposures low. Personnel in BITC have a low potential risk for the delayed incidence of cancer from using the cabinet x-ray inspection System

2. **Health risks to children of women who are occupationally exposed to radiation during pregnancy.** Scientists have recommended that the total radiation dose to the unborn child as a result of occupational exposures of the expectant mother should not exceed 0.5 rem because of possible increased risk of childhood leukemia and cancer. Since this 0.5 rem is lower than the dose generally permitted to adult workers, the Air Force has established a policy to ensure so far as is possible that pregnant workers will not be exposed to levels of radiation that will result in a dose greater than 0.5 rem to the unborn child. All fertile females working in BITC are required to read and sign the briefing in attach 2.

3. **Maximum permissible dose limits.**

a. Your shop is required to be on the quarterly Thermoluminescent Dosimeter (TLD) Badge program, because of the potential for exposure to ionizing radiation associated with the use of x-ray equipment. Specifically, and more importantly, the innervu cabinet inspection system unit which you will be using soon. The maximum permissible dose for your shop has been set by the Radiation Safety Officer (RSO) at .625 Rems (R) per quarter. This number is a guideline applicable only at Whiteman. At your next base, it may be higher or lower. The **abnormal** exposure action level set by the Air Force is 1.250 Rems for a quarterly badge. The local maximum permissible dose and abnormal exposure

action level mean that if a TLD badge result shows levels above this number, then an investigation needs to be conducted to determine the cause.

b. BITC personnel use the x-ray cabinet anytime a suspicious package comes through the mail. This time may vary considerably. This exposure is non-routine, as personnel only use this when tasked to provide secret service support.

4. **Protective measures required.**

a. Personnel performing x-ray procedures are required to wear their TLD badge. The body badge should be in front of the body between the shoulders and hips with the nametag facing the body.

b. The control badge should never be removed from its storage location, except for exchange of badges, which is done by Bioenvironmental Engineering (BEE) personnel. The control must **never** be worn for any reason.

c. Prior to performing x-ray procedures, personnel must process through Bioenvironmental Engineering (BEE) and receive specific training for the TLD program. BEE must be contacted for entry into the TLD program.

d. Innervu Cabinet X-Ray Inspection System. Personnel should stand at least 15 feet away from the x-ray machine. Personnel should never enter the area immediately in front of the x-ray. Personnel should control entry into the area where they are using the x-ray by locking doors, or using personnel as warning signals. Personnel should follow all procedures as outlined in the operator's manual for operating this equipment.

e. Innervu Cabinet X-ray Inspection System. When this unit is in operation, personnel may be required to use it during bomb inspection taskings. The Air Force sets the maximum permissible dose is 2 mR/hr, or 100 mR in seven consecutive days.

5. **ALARA philosophy and practice.** As Low As Reasonable Achievable (ALARA) philosophy applies to all Air Force Military and civilian personnel. The ALARA concept is defined as that set of management and administrative actions taken to reduce personnel radiation dose to as low a level as possible consistent with existing technology, costs, and operational requirements. The ALARA concept was developed in response to scientific evidence that suggests that no level of radiation exposure is totally risk free (linear, no threshold dose-effect relationship). While the established maximum permissible doses are conservative and offer a low risk of adverse health effects compared to other hazards of life and occupation, it is prudent that every effort be made to reduce exposures to the lowest level that is reasonably achievable and thereby lower the health risk associated with that exposure.

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Base Radiation Safety Officer

Attachments

TNG disk: a:alara\eod.doc

1. Initial TLD Briefing
2. Fertile Female Briefing

PRINTED NAME _____

SIGNED NAME_____DATE_____